

Listing of Claims

The below listing of claims will replace all prior versions of claims in the application.

1. (Currently Amended) An integrated circuit package for an image sensor chip, the image sensor chip including a sensor area for sensing incident light and a circuitry area, the package comprising:

a substrate including a first surface for receiving an image sensor chip and a second surface having an array of contact terminals formed thereon; and

a heater element having a first terminal and a second terminal coupled to a first contact terminal and a second contact terminal, respectively, of the array of contact terminals, the heater element being positioned on the first surface of the substrate and directly underneath the sensor area of the image sensor chip to be assembled in the package, the image sensor chip to be placed directly on the heater element,

wherein the heater element provides heating of the sensor area of the image sensor chip when a first voltage is applied across the first contact terminal and the second contact terminal; and

wherein the image sensor chip is attached directly to the heater element and the first surface of the substrate using an epoxy glue so that the heater element is sandwiched directly between the sensor area of the image sensor chip and the first surface of the substrate to provide direct and localized heating of the sensor area of the image sensor chip.

2. (Cancelled)

3. (Cancelled)

4. (Original) The integrated circuit package of claim 1, wherein the package comprises a ball grid array package and the array of contact terminals comprises an array of contact balls.

5. (Original) The integrated circuit package of claim 1, wherein the package comprises a land grid array package and the array of contact terminals comprises an array of contact pads.

6. (Original) The integrated circuit package of claim 1, wherein the package comprises a pin grid array package and the array of contact terminals comprises an array of contact pins.
7. (Original) The integrated circuit package of claim 1, wherein the package comprises a ceramic or plastic leaded chip carrier and the array of contact terminals comprises an array of contact pins formed on the side surfaces of the package.
8. (Original) The integrated circuit package of claim 1, wherein the heater element comprises a resistive heater element.
9. (Original) The integrated circuit package of claim 8, wherein the resistive heater element comprises a material selected from conductive plastic and conductive metals.
10. (Original) The integrated circuit package of claim 8, wherein the resistive heater element comprises tungsten formed in a narrow serpentine shape.
11. (Original) The integrated circuit package of claim 1, further comprising a protection resistor coupled between the first terminal and the second terminal of the heater element.
12. (Original) The integrated circuit package of claim 11, wherein the protection resistor comprises a high resistance resistor.
13. (Original) The integrated circuit package of claim 12, wherein the resistance of the protection resistor is about 100 Ohms or greater.
14. (Original) The integrated circuit package of claim 8, wherein the first terminal of the heater element is connected to the first contact terminal through a first via interconnect through the substrate of the package and the second terminal of the heater element is connected to the second contact terminal through a second via interconnect through the substrate of the package.
15. (Original) The integrated circuit package of claim 1, further comprising a heat spreader formed in the substrate.